

NORTH CAROLINA DEPARTMENT OF NATURAL AND CULTURAL RESOURCES
OFFICE OF ARCHIVES AND HISTORY



Transcript of an
Oral History Interview with Dr. Lindsay Zanno
SHE.OH.006
May 22, 2019

Interview Information:

Interviewer: Ellen Brooks

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Transcribed By: Julia Kane, Kelley Young, and Sarah Waugh, June 2020

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Collection: "She Changed the World" Oral History Project

Interview Summary:

This oral history interview with Dr. Lindsay Zanno covers her general life history with a focus on her education and career as a paleontologist. Dr. Zanno did her post-doc work at the Field Museum of Natural History in Chicago and then was a professor at the University of Wisconsin at Parkside before moving to North Carolina. Dr. Zanno is currently (at the time of the interview) the Head and Curator of Paleontology at the North Carolina Museum of Natural Sciences. She also is an assistant research professor at North Carolina State University's Department of Biological Sciences. She has been part of many discoveries and publications in the field of paleontology.

Dr. Zanno was born and raised in New York. She received her higher education degrees in New Mexico (University of New Mexico) and Utah (University of Utah). After meeting her future husband, Terry Allen Gates, in the same program at the University of Utah, the couple moved to Chicago, Illinois with their daughter, Sapphira Belle Gates. After the birth of their second daughter, Aviglia Rose Gates, and a semester teaching at UW-Parkside, Dr. Zanno accepted a joint position at the North Carolina Museum of Natural Sciences and North Carolina State University.

In the interview, Dr. Zanno discusses growing up and enjoying exploring outdoors and participating in creative hobbies. She describes her lifelong love of science, and how that love inspired her to pursue an education in science. She talks about her college and graduate school experiences and attending school across the country from her family. She describes being the only woman at various paleontology conferences and in her program during graduate school and how those experiences impacted her approach to her own career.

Dr. Zanno describes her current position, speaking directly about the joy she gets from educating the public about science, as well as citing her pleasure when she gets the opportunity to simply work in the lab. Dr. Zanno continues to participate actively in paleontology, the broader STEM fields, and enjoys gardening to relax. Her passion for public engagement in museums propels her forward in her career as she continues her work at the North Carolina Museum of Natural Sciences and North Carolina State University.

Biographical Sketch:

Dr. Lindsay Zanno was born on October 17, 1976 in Port Chester, New York to Sally Ann Zanno and Paul Robert Zanno. She attended Millbrook Elementary School (1980-1984), Millbrook Middle School (1984-1987), Millbrook High School (1987-1994), Dutchess Community College (1995-1997; AS Science), the University of New Mexico (1998-1999; BS Anthropology), and the University of Utah (2001-2008; MS Geology; PhD Geology) and completed her postdoctoral fellowship at the Field Museum of Natural History in Chicago, Illinois. Dr. Zanno's husband is Terry Allen Gates, and they have two children, Sapphira Belle Gates and Aviglia Rose Gates. Dr. Zanno has been a professor since 2011, completed numerous paleontological field expeditions, served as the director of the North Carolina Museum of Natural Sciences Paleontology Research Lab, served as a graduate advisor and dissertation chair, and received many honors and grants. She is currently the Head and Curator of Paleontology at the North Carolina Museum of Natural Sciences and an Assistant Research Professor at North Carolina State University's Department of Biological Sciences.

Archivist's Note:

Transcriptions reflect the original oral history recording. Due to human and machine fallibility transcripts often contain small errors. Transcripts may not have been transcribed from the original recording medium. It is strongly suggested that researchers engage with the oral history recording as well as the transcript. Timestamps are approximate.

Interview Transcript:

- Brooks: Today is May 22, 2019. This is an interview with Lindsay Zanno, head of paleontology at the North Carolina Museum of Natural Sciences. This interview is being conducted for the North Carolina State Archives "She Changed the World" Oral History Project. The interviewer is Ellen Brooks. Alright, so let's just start at the beginning, if you can tell me where and when you were born.
- Zanno: I was born in United Hospital, in Port Chester, New York, on October 17, 1976.
- Brooks: And did you grow up in Port Chester?
- Zanno: No, my family moved to Hopewell Junction when I was young, and then, um, around second grade we moved to a small rural town called Millbrook, in New York, so we continued to move further north.
- Brooks: Mm-hm. And what did your parents do for a living?
- Zanno: Uh, my mother and father divorced when I was three. My mother was an RN, and my father was a, uh, chemist. He worked for food companies doing food flavors.
- Brooks: Um, siblings?
- Zanno: I have a sister who's six years older than me; she's an artist and a waitress, living in Park City, Utah, and I have a half-brother who's twelve years younger than me, and he's a jeweler. So, a lot of art in my family.
- Brooks: Yeah, a lot of art and science.
- Zanno: Mm-hm.
- Brooks: Yeah. Um, okay, so tell me a little bit about what you were like as a kid, growing up.
- Zanno: Oh, well, I was a latchkey kid, so I lived with my mother and my sister, but because my sister was six years older, by the time I was twelve she was gone. My mother worked full time, um, so I spent a lot of time alone, and I really loved being outside. I spent a lot of time just exploring around, outside in my yard, trying to learn about nature and just sort of being engaged in the moment outdoors.
- Brooks: What about school? What kind of student were you?
- Zanno: Um, I—I was a bit of a dichotomy when it came to being a student; I was like, grades were super important to me, but I also didn't wanna work that hard to get them, so when it came easy, it was great [laughs]. And, you know, when it was—if it required a lot of work, then I probably wasn't as engaged with school as I should have been at the time. There were a lot of other great things happening in life, too, to engage with.
- Brooks: Yeah. Were you into extracurriculars, or like hobbies?

Zanno: Um, I didn't have a lot of hobbies. I had asthma until I was about twenty-two, so I did play field hockey, which was fun, but we were such a small town; my high school had—my graduating class was like fifty-eight kids [laughs]—that we didn't have enough people to run the team every year, so we only played for one year, um, and I did art. I always loved to do art, so after school I would do art; I would write poems; I would paint. Um, yeah, I liked to do creative things.

Brooks: Um, and all of this—growing up—were you still in New York throughout your early education?

Zanno: Yeah, I lived in New York until I was twenty years old, actually.

Brooks: Cool. Um, so anything, once you started getting into high school and kind of the older end of your secondary education, um, did you have any particular decision—or did you have particular feelings about what you wanted to do for your career?

Zanno: Yeah, I think I always knew science was my first love. I loved math; it all came really easy to me, and I sort of knew I would go that direction, but, you know, there was not a lot of adult supervision in my home, and I didn't have a lot of adults sort of shaping what my trajectory could be. I didn't really know what it could be. I knew I was doing really well in school, and so I thought, Well, if you're doing well in science and math and you need a career, maybe go into medicine. And so I sort of left—when I left and graduated high school, I didn't go to college right away. Actually, I worked in a hotel [laughs], cleaning rooms, and then realized that math and science and art were the only things I ever really loved, and that that was so much of my identity, because it was where I had been so successful as a youth, um, that that was really the only successful, happy path forward for me, so then I enrolled in college to start with pre-med. I wanted to do neurosurgery, but it turns out I'm really bad in a lab. [both laughing] It's just really boring for me, most of the time, and I'm really more of a discovery-based person. I did an internship, um—because I was doing really well in some science classes in high school—I did an internship with an ecology institute near my home in Millbrook, and I was doing titrations in the lab all summer, and I just hated it, and it just was obvious that that wasn't gonna work for me.

[00:05:03]

Um, so I did two years of community college in premed, and one year my mother bought me a coffee table book called From Lucy to Language—she always loved to buy me books—and it was this gorgeous, full-colored, glossy book with all these human fossils. And so I sort of digested this thing, and something in my head just exploded. And I—I felt like I had a purpose, and I knew what I was most passionate about was sort of understanding the story of how the world got to be the way it was—not so much how it is now, but, you know, what was the story of getting there? What was that journey like for life on Earth? So, I went to my

local library and I read every single book on paleoanthropology I could find, I just sort of devoured them all, and then, um, applied to the University of New Mexico for their paleoanthropology program, which was two thousand miles away from my home, and got in and just told my mother that I was leaving and packed up my car and drove out to New Mexico and started school there for anthropology, and that's what I ended up doing my bachelor's degree in.

Brooks: And what made you choose that specific school?

Zanno: Okay, that's a funny story.

Brooks: Okay.

Zanno: The reason I chose New Mexico is that I had no idea where I wanted to go, but I had a road atlas, and I said, "Well, I'll just close my eyes, and I'll flip open the atlas and put my finger down, and whatever state I land on, that's where I'll go to school." And I did that, and, um, landed on New Mexico, but the thing was that the atlas was actually stapled on that page [laughs], so I think if I did it a thousand times again, I would've landed on New Mexico every time, [Brooks laughs] so I guess I was sort of destined to end up there.

Brooks: Yeah [laughs]. Um, so before we move on to your anthropology degree, did you have any other jobs or work experience before the hotel?

Zanno: Yeah, I started working at fourteen. Well, actually, I started younger than that. I was an usher in a theater, and I was really bad at it. Um, and I think my mom just wanted the theater tickets, so that's why we did that. Um, and then I started, at fourteen, working in the diner. I was also a really bad waitress. It turns out I'm just not really good at serving people. My sister's amazing at it and I'm just rotten at it, um, so that also didn't last very long, but I had a number of service jobs, doing waitressing and housekeeping and things like that.

Brooks: Um, so what was it like leaving New York for the first time and packing up all your stuff?

Zanno: It was, uh, it was exciting, it was terrifying, um, I remember my father—I had very little interaction with my father; I saw him a couple times a year, um, but he did take me around to colleges when I was looking at where to go. We went around on a road trip together, which was the first sort of thing. And so, when I was going to New Mexico, he said he would drive with me, so we drove out there together, and I remember, you know—Albuquerque's a huge city, and I hailed from a really small town, and he, um, left to get back on the airplane—I had dropped him off at the airport—and he handed me a knife, and he said, "Good luck!" [laughs] And he got on the airplane, and I just remember standing there at the airport with this, like, four-inch knife, and thinking, Oh my god, what have I just done? Like, I'm just here all alone; I'm two thousand miles from any family,

and of course it was the best experience of my life, right. It just got me started on a whole new path.

Brooks: What were some of the first impressions that you had?

Zanno: Um, I think it was kinda lonely. It was kinda lonely there. Um, and I worked in school, so I just went from school to work, and I was very focused on my studies, so I didn't make a lot of friends there or meet a lot of people, but I had some really great experiences because that's when I first started volunteering for a museum. And I started working in the naturalist center there, so I would show people the tarantulas and the snakes, and really wanted to get involved with the paleontology group, met a grad student there who was doing his PhD, Andy Hecker, and started to help him with his data. He started to take me out in the field, and that's when I realized that there was so much more than human fossils to explore and study, and the world was so much bigger—in terms of what had happened on the planet—than I had really experienced before. And I got really excited about thinking about times more distant than human beings.

Brooks: So, at what point did you start thinking about what your career could be?

Zanno: I think from the time I first really started volunteering with Andy and going out in the field looking at, you know, ancient reptiles instead of ancient humans, that's what I knew I wanted to do. I mean, I didn't know you could be a paleontologist. I'd never met one. I can remember going to the American Museum as a child and thinking, If I had one place I could work, like, to work in a museum would be the most incredible experience of my life, and it is. [both laughing]

[00:10:12]

Brooks: Um, so while you were working with Andy and taking classes in New Mexico that's when you kind of started realizing that paleontology was your path? And that working in a museum would be—'cause, um, I'm assuming there's not a lot you can do with a paleontology PhD, is that true?

Zanno: That's true, yeah, it's a very niche discipline, and you know, it's funny, I had always thought that when I did get into a grad program—and it took a while—that if I could—if I just did this in grad school, and I never got a job, would it be worth it? That was the kind of question you had to ask yourself every day, right, because you were living below the poverty line, and you were, you know, struggling for years and years to get these degrees, and you didn't know what the outcome was gonna be on the other end. So you kinda had to be in it for that experience and be okay with that, or you really can't be in it. So, I was—I was kind of okay if that was the journey and then I had to switch to something else, it would have been worth it.

Brooks: Did you have a plan B?

Zanno: No. [both laughing] I didn't have a plan B. I'm very single-minded sometimes, and very stubborn, and I just, um—I never really thought I was gonna fail at this, so—

Brooks: Um, so that was your Bachelor of Science, in New Mexico, and then you decided to pursue your Master of Science, correct?

Zanno: The final year of my bachelor's degree when I was in New Mexico, my mother was diagnosed with stage four breast cancer, and she called me that fall, the beginning of my fourth year, and told me about it, and it was the hardest time of my life because I just wanted to quit and go take care of her. She had always wanted to go to the Ivory Coast in Africa, in the Peace Corps, and work with children. It had been her dream, and she had, according to her, put it off her whole life to take care of us, thinking that when we all left and went off to college, she would go pursue this dream. So she had applied to the Peace Corps, and she had gotten in, and she had passed all the tests, and she had sold our childhood home, she had sold everything in it, and she had moved to my grandmother's house in Florida, where she was gonna get ready to get on a plane, and she had just passed the medical exam, and that's when they found her cancer. So, I wanted to go just quit and go straight down there and take care of her, and she insisted that I stay in school and just finish, so I had to make it through that last year of college with all of that going on, and I would just come out of my classes and cry. I mean, it was just a horrible, horrible time, but I managed to finish and graduate, and then I moved that summer to my grandmother's house to take care of my mother. And she lived for another, um, maybe nine months, and then she passed away in May the following year, May of 2000. So I hadn't—so I'd finished undergrad, but I hadn't really been able to deal with grad school at that time.

Brooks: Yeah.

Zanno: And I remember my first set of interviews—I did my first set of graduate interviews for graduate school that spring of 2000. I went to Yale; I went to UFC, and I was really messed up in the head, right, so I did a terrible job of those interviews, and so I didn't get in, and, um, then I had the decision about whether to try again the next year after my mother passed, and I did, and I ended up getting into the program at the University of Utah. And so, um, so then I got to continue by doing my master's over there.

Brooks: Hm. And why Utah?

Zanno: That was another kinda random thing. My sister had decided she wanted to live out west, and so she had moved to Utah, and so I thought it would be good to be near here, and I just applied to the University of Utah. But I didn't actually know they had a paleontologist there 'cause he had just been hired, and they were not advertising that he was there yet. So I didn't even really think much of it, but then,

yeah, he offered for me to come out and interview with them, and it was an amazing program, and so it just made the most sense to go out there.

Brooks: And what program was it?

Zanno: It, um, was a new program, invertebrate dinosaur paleontology, that he had set up in the geology department. And so I had an undergrad in anthropology, and I had a minor in biology and geology, but now I was doing a master's degree in geology, so I was really behind the curve in terms of not having had a geology undergrad. But that's sort of the way so many of us paleontologists, our academic paths go. Because paleontology is such a broad discipline, we sort of enter with all these different backgrounds, and I think that's one of the things that makes our discipline really special, is that there isn't sort of a linear path to get there.

[00:14:51]

Brooks: Yeah. Um, so how long was that—was that program?

Zanno: So, I entered that program, um—and it was a two-year master's program—and then I met the man who would become my husband and got engaged and then got pregnant unexpectedly, and so then had to finish my master's degree with a new baby. And he was in the program as well, and it's virtually impossible to secure two graduate degree programs in paleontology with two individuals in the same place, so since we were both there, we'd both just finished our master's, we, um, applied to stay on in that school and do our PhDs, so we both ended up staying there for another five years, doing our PhDs together there.

Brooks: Wow. That's neat [laughs]. Can you talk a little bit more about what it was like, finishing your degree with a baby—a newborn?

Zanno: Oh, it was rough [laughs]. It was really rough. Um, I—you know, my program was heavily focused on field work, and I sent two months of my pregnancy in the field before I knew I was pregnant; we were in Mexico for five weeks, and I got violently ill. I had, um, fungal pneumonia from spores that came out of the ground, and I was pregnant, and then I broke out in hives, so it was just total, like, physical mess. We were there for five weeks, and then I think my fourth month of pregnancy I also did a month of dissertation field work in the Utah desert. But then after that I couldn't really go anymore, and my, uh, fiancé at the time was committed to going out through the fall. In fact, they insisted he go, so I was three—I was in my third trimester. So I ended up working—so I was working, and very pregnant, and getting my master's degree for those last three months. It was kind of an intense time, and I was alone. Um, and my fiancé got to come back, I think maybe seven days before, um, we had my daughter.

Brooks: When you say "working," were you working for the university? Or did you have another job?

Zanno: I had another job; I had to go—I didn't have any support, financial support, so I had to go get another job, and I worked—I think it was the Forest Service—doing public survey comments on proposed projects by the Forest Service.

Brooks: Mm-hm. Um, and so what year was your daughter born?

Zanno: She was born in 2003.

Brooks: Um, and then you stayed on in Utah, and so did your husband—did you both go for the same PhD? Were you in the same program?

Zanno: We were in the same program with the same advisor.

Brooks: Okay. Wow. How was that?

Zanno: It was fine. Um, I was the only woman to ever go through that program, so there were a lot of issues with, you know, never having encountered these sorts of situations, you know, a grad student with a baby, and these other sorts of things, and so it was definitely a challenging time for the two of us to figure out how to balance this family issue and both of us doing our PhDs in the same program. You know, because there are certain, um, responsibilities that come with being in a lab, you know, where they need you to do things, and when two of you have challenges like that, then it sort of magnifies the problem from the lab's perspective. Um, but, I mean, it was an incredible program. We had so much opportunity there. You know, new dinosaurs were being discovered in that region, and we had the opportunity to name some of those and work on really cool exciting projects. And my advisor actually ended up having to—he got a job, um, I think it was the first year of my PhD, and ended up moving away from the museum and out of state, and so I did the majority of my PhD, you know, somewhat unsupervised. Um, which was okay [laughs].

Brooks: Yeah, I was gonna say that's a good thing— [laughs]

Zanno: Yeah, it was okay, and he was there if I needed him, but he wasn't physically there, you know, sort of overseeing the whole thing.

Brooks: Do you have any, like, memorable first times in the field, or discovery stories?

Zanno: Um, I mean, I remember the first dinosaur I discovered; it's a dinosaur called *Parasaurolophus*, which is an incredible animal. It's a duck-billed dinosaur—so a big plant-eating dinosaur—and it's fascinating because it has this enormous, like, three-foot crest on the back of its head. Um, it's a really beautiful, mysterious kind of animal, and I remember the first time that I discovered one of those skeletons, and it was thrilling. Yeah, it was fabulous.

Brooks: Where were you?

Zanno: Uh, we were in the Kaiparowits Formation, it's a late Cretaceous formation in southern Utah. And field work was a challenge.

[00:19:44]

Zanno: I really wasn't prepared for what it was gonna be like. I had done field work as an undergrad, and it was a very, very different situation. You know, we had been able to drive close to the sites, and yeah, we, you know, shoveled all day, but it was easy to access the sites. When I moved to grad school in Utah, the area where we were working was incredibly steep, incredibly remote, and most of the people on the team were incredibly experienced. And, you know, I'm five foot one [laughs], and so getting into the mentality of that I could do this, and keep up with these guys, who were, you know, in many cases, twice my size, um, it took some time to get there and get comfortable with that.

Brooks: Was that kind of one of the hurdles that came with, um, being the only female to go through the program?

Zanno: Yeah, it was. I mean, I can remember, um—you know, I wish I could say that for many people on these crews, that everyone was really supportive, but not everybody was, and, you know, it's a very physically demanding discipline, and historically it's—there's a lot of machismo involved in geologic and paleontological field work. I can remember things like we would—you know, to get a fossil out of these really remote places, um, we'd strap it to a stretcher, and it would weigh three hundred pounds, and we would have people all lined up around the stretcher that would hand-carry and muscle these things up cliff faces, you know, up vertical cliff faces and miles to get them back to camp, and I can remember, you know, being in the rotation and moving to the front of the sled as we approached this hill, and you really have to be able to lift a lot of weight to be at the front 'cause you're gonna have to tilt up so you can get up the hill, and I couldn't do it. And, you know, instead of being asked to, like, "Okay, move to another area," I was just dismissed.

Brooks: Mm.

Zanno: And I was told, "Just go back to camp." Basically, you know, "You're useless and you can't help." And so, you know, in retrospect for me—I didn't recognize it at the time of how much sort of mental damage it was doing to my ability to think that I could, you know, compete on this level with the physicality of what paleontological field work was. And there were no—the only women that were there were generally women that were, um, a significant other to someone else, so the people that were there weren't struggling to get through the program and get a professional degree, so there really wasn't anybody to sort of work together with, or—

Brooks: Mm-hm. Was that anything that—I guess I'm wondering what your initial reaction was when you discovered that you'd be the first woman to go through the program.

Zanno: You know, I honestly—it's incredible, but I didn't think about it. I didn't think about the fact that I was the only woman there. I had no sense of, um, many of the issues that I'm cognizant of today. Just—they weren't on my mind. I had grown up in a family of only women; we had done everything that needed to be done. There were no, you know—my father wasn't around to do things, and there were no men in our lives around to do things, and that kind of distinction between man and woman didn't really occur to me until I got in these situations, where, you know, you're really pushed to the physical extreme, and it was clear that whatever expectation they had of me, I wasn't meeting it. Um, but I also learned the most important lessons of my life at that time, which is that it's not so much about your physical capabilities as your mental determination, and it sounds really cheesy, and it sounds impossible, but the things I could do when I just stopped telling myself what I couldn't do, um, really liberated my mind to the possibilities of what I could achieve.

Brooks: Sounds a little bit like what people say about bootcamp when they're in the armed forces, just kind of like you don't think you can do it, and then you do.

Zanno: And then you do.

Brooks: Yeah.

Zanno: And it is bootcamp [laughs].

Brooks: Yeah [laughs].

Zanno: It's science bootcamp, in a way, it absolutely is. Yeah, yeah.

Brooks: When you're doing field work, um, are you typically living, like, near the sites, or on the sites, like is it a camping situation?

Zanno: Yeah, we set up a remote camp. There's no facilities; there's no running water; there's often no cell service. You know, you're off the grid. Um, and we live as a team, and we care for each other, and we work incredibly hard. But I—I feel like now that I've had the opportunity to set that cultural environment in the field for myself and my team and my crew, I'm so honored to have the ability to make that a supportive environment, at least as supportive as I can, so that people can, um, really find out what they're capable of, instead of sort of feeling like there not meeting up to somebody else's expectations.

Brooks: So, uh, your PhD program was five years, did you say?

[00:24:48]

Zanno: Yeah, I think it—I did two and a half years with my master's; I took a semester off with my first daughter, and then I did four years with my PhD, or so. So I was there about seven years.

Brooks: Yeah.

Zanno: Yeah.

Brooks: How did you feel about Utah in general?

Zanno: You know, I liked Utah. It was a culture shock being there, obviously. I'm not a very religious person. But in general the university was a great place. The geology department was incredible—it still is—such an incredible department. Everyone who graduated from there did really well and was very successful, and, um, yeah, I enjoyed being there, and I miss Utah a lot, although I get to go back for about a year—or, I'm sorry, about a month every year. So I kinda feel like it's my second home, still.

Brooks: Um, anything else about grad school or PhD?

Zanno: I don't know, I guess what I would say is that I did my PhD in a museum environment, which I think was really important for my professional development because I had the opportunity to do a lot of public outreach and give talks and work at an on-exhibit lab, and interact with the public, and my advisor was just a stellar science communicator, and I learned a lot from him about, um, you know, how to be good at that and how to care about it, and I always did. For me, doing the science is one thing, and sharing the science is what makes it really special. You know, inviting other people to be part of that discovery process is really important to me, and it's really powerful, so I lobbied on to that really early, and it's kind of been a defining, I think, passion that's led me where I am.

Brooks: Yeah, that's great. Yeah, I was gonna ask about kind of the different directions you could've taken, but it seems like museum work has always been something you've felt called to, and education is a big part of that.

Zanno: Yeah.

Brooks: Um, so, did you and your husband have conversations about what was next after you finished your PhDs?

Zanno: Yeah, I mean, that's another sort of—you have to be comfortable with that component of this, because when you have an academic spouse, you sort of know one of you is gonna get an offer and the other is maybe gonna have to maybe make some sacrifices, so we sort of knew. And when I finished my PhD, I applied for a post-doc at the field museum with someone, a scientist I really respected, and was blown away to have gotten it, [laughs] and so I—actually, we were just moving to Chicago to go live, which was a bit of a culture shock, too—from Salt Lake, um, to move to Chicago. And I, again, remember the first day I walked up to the Field Museum and thought, "I'm working here?," and it was just the best feeling in the world, I mean it was just an incredible institution, a gorgeous building, and, you know, you could just get—you could just spend years wandering around in there, exploring that place.

Brooks: Yeah.

Zanno: It was really cool.

Brooks: For a lot of types of fields, post-docs aren't necessarily a thing, so can you—and I know in science it's a little bit more standard—but can you talk about what exactly is a post-doc, and what type of work you were doing at the field museum?

Zanno: It's kind of like an internship leading up to an academic position or curatorial position. You know, you're so focused on becoming a good scientist, but running a lab—being a faculty member, or being a curator—it's like running a mini corporation, and you don't get trained as a graduate student in how to do that. You get trained in how to mentor students; you don't get trained in how to deal with grants, um, how to deal with administration, how to work with colleagues. I mean, you're basically just focused on science all the time, so post-doc is a really—if you get one with someone you respect, as I did—it's really wonderful way to get, like, professional development and get your feet under you and start to learn how to raise the funds to do your job, because academics is such a strange thing. When you're hired, you're given all these responsibilities and tasks, and you're told to go get the funding to do it, and it's such a strange concept, right—just to do your job, you have to go raise the money. Um, but I also learned—so I did my master's and PhD in geology, and I did my PhD on mostly comparative anatomy—so looking at the skeleton of different dinosaurs and figuring out how they were related. Um, but the wonderful thing for me was that I got to go work with Pete Makovicky at the Field Museum. I did my post-doc in evolutionary biology, so I got to learn from him about how to ask bigger questions and how to be really rigorous about approaching those questions. So, it was sort of developing further as a scientist into new ways of thinking and new skills, to sort of maybe have a bit more broader impact in the science than I would have been able to have before.

[00:29:53]

Brooks: So, was there such a thing as a typical day when you were doing your post-doc?

Zanno: Oh, I spent so many days just crunching data. I spent six months just crunching data, because I'm not a very good programmer, so I would often do things by hand [laughs] that probably other people could've programmed a computer to do. But, um, yeah, I mean, I would go to my office in the Field Museum; it was like a little corner. They had all these dark, closed-off spaces that people never get to see, and I would just start crunching data, and my post-doc mentor would come by, and we'd go for a coffee, and then I'd go back to work and crunch data all day, and that was kind of it. And that was fun actually. [laughs] It doesn't sound like it [Brooks laughs], but it was a lot of fun.

Brooks: Yeah. So it did nothing to dissuade you from continuing your career in that vein?

Zanno: No, it was the one time in my life when I knew the most about something I was working on. I mean, I knew every single detail about it. You know, I could've spent years writing up what I knew, but that's not the way it works in science, right—you just write that paper that's like scratching the surface of what you've been doing, and the rest of it kind of just dies off, and you move on to something else.

Brooks: Mm-hm. Was there a certain, like for a post-doc was there an end product, or a goal that you try to reach, or is it just kind of like a job where you—

Zanno: You're just trying to pump out research—high-impact research publications—and maybe start getting, you know, the first big grants so that you can be competitive for a faculty job. Yeah, and I did a lot of interviewing for jobs at that time; I interviewed with a lot of places. Um, and, you know, then you're also refining your speaking abilities, and your communication skills, and also, we did a lot of field work, so you're kind of getting your independent field program established on your own, too.

Brooks: Um so was this, uh—were you at the Field Museum before or after Sue the dinosaur?

Zanno: After Sue.

Brooks: After Sue, okay—

Zanno: Yes, after Sue.

Brooks: So, you had the chance, to kind of—I mean, I guess they have other fossils as well—but um, yeah, I just know—I'm from Chicago—so Sue was just a very big deal.

Zanno: Yes.

Brooks: And so, I feel like you know—I don't know if there—if there was any part of that story that had an impact on your career.

Zanno: I don't think so. I mean, I had heard about Sue, um, but Sue was bought by the Field Museum when I was in undergrad, um, so I didn't even know I wanted to be a paleontologist back then. Um, I remember, like, seeing Jurassic Park as a high school student and that having an influence on me. In fact, I saw it at the drive in, in the woods, and I just remember the T-Rex being on the screen—in the woods, in the dark, in the drive in—and it was just a cool experience, [laughter] and I think so many of us um were inspired by just the emotional connection of seeing a dinosaur come to life. Um, it just sort of has tentacles it gets deep down inside you and makes you feel really excited about contributing to learning more about their biologies so I think a lot of us have that sort that memory of seeing Jurassic Park for the first time.

Brooks: Do you, um has it gotten old like now that—like with all the different Jurassic Parks, now the Jurassic Worlds?

[00:33:07]

Zanno: I'd like to say it gets old, but it really doesn't. I mean, I'm not saying I'm a huge fan of all the movies but, um any you know we worked so hard on such an incredible level of detail on these you know, ancient fossilized bones, and they're just bones. And anytime you see an artist reconstruction or a 3-D model or animation of a living breathing dinosaur, it just reminds you, you know of what, you know, why you're doing this or what you're trying to get at, and that these were living breathing animals, and, you know, it sparks something sort of, sort of, a renewed enthusiasm and passion for what you're doing.

Brooks: Yeah, that's great, so it's not like oh God, they got that wrong or, Oh they, you know—

Zanno: Oh sure we do that—

Brooks: [laughs] So it's some of that—

Zanno: Yeah, we do that, and I remember one year at our big annual conference—The Society of Vertebrate Paleontology in Boseman—we went to the movie theater—like, imagine like 300 paleontologists in the movie theater watching Jurassic Park and like, booing. It was like, you know—being in the *Rocky Horror Picture Show* where the audience is, like, actively participating [laughs] in the movie, and that was so much fun. But there's just something wonderful about seeing dinosaurs brought to life.

Brooks: Yeah. A little bit of both, I can imagine. Um, so Chicago—how long were you in Chicago then?

Zanno: I lived in Chicago for, um—I wanna say three years.

Brooks: And was that all for post-doc?

Zanno: Most of it was for post-doc and then at the end of my time there I got a faculty job at the University of Wisconsin, in Kenosha, Wisconsin, but I was still living in Chicago, and I was commuting five hours a day, um, with a newborn, to go up there and be a faculty member.

Brooks: So, this is your second child?

Zanno: Yes, my second daughter was born while I was a post-doc in Chicago.

Brooks: And, um, did your husband have a job in Chicago too?

Zanno: Yeah, he taught at, uh, local universities during that time, and he also did a little post-doctoral work, working on the Sue project at the Field Museum.

Brooks: Cool. Um, great. So, your position at UW Kenosha, was that—that was your first time really in front of a class as a professor?

Zanno: I had taught as a graduate student. I had taught my own labs—geology labs—as a lead instructor, and I had guest lectured in a lot of classes, so it wasn't my first time in front of a class. It was my first time leading a lecture, I guess. And I taught anatomy to med students.

Brooks: Okay. Um, and how long was that?

Zanno: Well, that's interesting, because this job here at the North Carolina museum had been posted, and I had applied, and then it had been put on hold. And so then I had applied for the job in Wisconsin at UW-Parkside, and I had gotten it that summer. And then they had reposted this job, and so only six weeks after I started there, they invited me out for an interview and hired me here even though I had applied to this long before I had started there. So then I had the unhappy situation of having to tell them, having just started there, that I was gonna be leaving after one semester. So I was only there for one semester.

Brooks: And the job that you got here, what was that, initially?

Zanno: The job I got here was called the Director of the Paleontology and Geology Research Lab, and it had a joint appointment as a, uh, assistant research faculty member at NC State University.

Brooks: And why—why did you say yes?

Zanno: Oh, I said yes because this job was anything I'd ever wanted. It was a job in a museum, um, we had just—they had just opened this wing. In fact it wasn't even open when I got here, it was still under construction. Um, and the point of this wing was to communicate science and take people deep into the process of science and build trust for who scientists are, and what scientists do, and everything I was really passionate about. It was like the job was written for me. And I remember seeing that job—I can remember looking at the job application, that's how meaningful just seeing that job written out was. And then, the opportunity to have a joint position with a university where I could take students and have a graduate program and train students to become paleontologists and teach and have that—it's basically everything boiled into one. So that was the perfect position for me.

Brooks: Um, can you explain a little bit about what this wing is since you mentioned it? In terms of the different sides of the museum?

Zanno: Yeah, so, um, you know, every museum that puts up exhibits they typically put up exhibits that highlight what we've already discovered. So, when we find a dinosaur—or um, when we get around to naming and publishing and figuring out why it's important—then you would do the exhibit on it. And that's what almost

every major museum is. And Betsy Bennett and others had the vision to, you know, Why don't we take the public and our community deeper in that process? Why don't we, um, combat mistrust and misrepresentation of science by allowing people to, like, see science in action as it's happening and be part of it and be engaged with it and learn how it works? So when we get to the, Here's what we learned, part, people feel comfortable that they understand how we got there. And you know that's in part because so much of our society relies on the data that science generates. Information about our health, your medical decisions, your medications, the safety of your home, chemicals you use, transportation, you know. Everything is related to the outcome of science and what scientists have learned, but people don't know to trust that because they don't know where that information comes from or who those people are that are generating it. And so, this wing was built so that people could look at the process of science, see who the scientists are, and engage all throughout that process and come to understand how that works and how we get to that information that matters so much to them.

[00:39:36]

Brooks: So you said it wasn't open when you were brought on—did you help design at all or was it already pretty much finished?

Zanno: No, it was all designed. It was under construction, and, um, I got to do like a couple hard hat tours of what would be my lab, and it was just so incredible—the first time you get to walk into a place that's being built from scratch, and you know that you're gonna get to shape that space and create an identity for it, and that the public will be able to interact with that—it was very special.

Brooks: Um, so how long have you been here?

Zanno: So, I've been here since 2012. So, it's 7 years now.

Brooks: Um, what have been some of the challenges you'd say that you faced throughout your career?

Zanno: Um, I think the challenges I've faced are, um, pretty common to most people—you know, balancing a family and a career. Um, I work very long hours, and, you know, I do a lot of field work, which requires being away and out of communication for really long periods of time, you know, 6 weeks—sometimes longer. And then I, you know, I faced challenges being in a very male-dominated, physical discipline, where there wasn't a lot of female presence, and overcoming those sorts of biases along the way. Um, I think, I also faced challenges with myself, just, um, going from a very quiet, very isolated home to, you know, learning how to build great things with a large group of diverse people and work together towards common goals. And I think those are things, as we all get older, we all get better at.

Brooks: Just so we don't leave anyone out, do you—this is such an awkward way to ask this question, but is it, the two daughters, or do you have more?

Zanno: I have two daughters.

Brooks: Two daughters. Okay.

Zanno: Yes.

Brooks: I just didn't wanna [Zanno laughs] not mention a third if there was a third in there. I'm a third child, so maybe that's why I wanted to make sure. Um, great, so—just trying to decide where we should go next. Um, what—do you—do you have a specific—any specific memories about mentors and role models that really helped you throughout your career?

Zanno: You know, I get asked that question a lot, and, I wish I had a satisfactory answer. I just, um—I don't like to put people on pedestals—and I think, as opposed to having one role model, I sort of look around at the people in my life, and I look for what their best selves are and what I wanna emulate about that. And it's not any one person, you know, it could be just one gesture by one person one day, or, you know, one other person who's, you know, patient in the face of aggressiveness. You know, it could be anything. It's like the world feels like my role model. If I just pick and choose, you know, who I think is doing a better job at certain things than me, and then I wanna get there. And I try and give myself the latitude to take one step forward, two steps back [laughs] to become a better person. But I'm always just trying to be a better person.

Brooks: Have you had any experience being seen as or called a role model yourself?

Zanno: I have, I have. And um, you know, I wonder what that word "role model" means sometimes because I often had people contacting me and saying that I'm a role model for women, and I feel like that is very limiting. And I don't wanna just wanna be a role model for women, I wanna, you know, I'm gonna—if they're gonna look to me as a scientist, as a paleontologist, to help inspire young people to achieve, then I wanna do that for everybody. I don't wanna have to do that just for people who look like me although I recognize that's important. Um, so I feel like if you're being a successful role model, you can kind of serve for anybody, and if you can't serve for anybody, maybe you need to take a look at, how you can do that.

Brooks: What—so you said that the mentor and role model question was something you've been asked before, um—I'm kind of curious about what other questions you've been asked a lot, but I'm more curious about what people don't ask you, and what do you think—what kind of questions would you like to be asked?

Zanno: That's a great—that's a great question! [laughs]

Brooks: Thank you.

[both laugh]

Zanno: I'm glad you asked it! [laughs] What do I get asked? I get asked why I became a paleontologist. Um, I get asked why paleontology is important. I get asked, um, what my favorite dinosaur is [laughs]. All of these are my least favorite questions. [laughs] I don't get asked—you know, what my journey was like. I don't always feel comfortable talking about that, but I think there's an assumption out there, that, you know, the professors at the university have all walked this very simple straight easy path to get where they are. The truth is that my past, you know—there were a lot of moments where things could have gone a different way. And so I think there's some value in maybe sharing that story with youth that might be experiencing similar challenges and—um, you know, hopefully giving them something to know that they can achieve these things if they just don't give up on it. So I don't get asked about my personal story that much, and, uh, I think that's okay, but I think, in certain situations as I'm getting older, I might wanna engage with those groups a little bit more.

[00:45:20.21]

Brooks: How do you think, um—no, I don't wanna follow that up. 'Cause I'm not sure how to phrase it. But, um, what other types of, like, I guess, like, gender stereotypes have you faced professionally?

Zanno: Oh, my goodness! So I was the female director of a lab, and my assistant director was a man, and, pretty much for the first two years, every time someone who didn't know us would walk into the lab they would walk directly past me and straight up to him, and that was pretty frustrating for me. Um, but it's okay. [laughs] I mean, it's just the way—just the way it is. Gender stereotypes, um, there's just a million little cuts, you know, every day. And some of that too is because I'm a very small statured person, I think, too. Um, but I—again I think these are the consistent things that every woman faces kind of every day of her life—that every woman who will be listening to this interview will know—that you face those same sort of micro-cuts every day in just trying to do the same things that everybody else can do.

Brooks: So what type of—I have a feeling you're not gonna love this question either, but I'm gonna ask it—what type of advice would you think you'd have for women, especially younger women, in terms of dealing with that in the workplace specifically?

Zanno: Um, I don't know that I have any advice. I mean, I don't know that I've found successful ways of combatting stereotypes against women. And I don't spend my days thinking about it. Every now and then I'll encounter a situation where I'm thinking to myself, "You know, I think this would probably be a lot different if I weren't female." That being said, I think that there's a Catch-22 for women. You know, if you speak up on behalf of yourself, that's often viewed very negatively.

And um, I wish I could say that I feel like I've been very brave in my life, that I've taken a stand about a number of things, or I've pushed and shoved my way through to success, but I just try and work the best I can with everybody and not—you know, sometimes you just have to keep your head down, and keep trucking through things. And that's certainly true for graduate students, and I really—as I get higher up in my career, I think about the culture of being a grad student a lot. Because it's a very precarious place to be, and you're very, very vulnerable at that stage because you're entirely dependent on your advisor to—you know, they hold your whole career in their hand. You know, when I was a graduate student, um, there was one paleontologist—vertebrate paleontologist—at the university, and if that relationship had broken down—you know, if something had transpired where I felt like I needed to stand up for myself and put that relationship at risk, I would've not been able to get a PhD and my aspirations of being a paleontologist would basically have been over. That's the level of vulnerability you're in as a grad student. And so I worry, um, about the culture of graduate programs and, you know, the vulnerability of graduate students to maybe speak out and help better the culture of these programs or better themselves, um, because they just don't have that option.

Brooks: So how much of your time do you spend teaching now?

Zanno: Um, so I teach generally in the spring and in the summer. And then in the fall I end up doing a lot of traveling so I usually, spend most of my fall away from here [laughs] at the museum.

Brooks: So, you have a—still have a decent relationship with students though in terms of being able to mentor them and—or, do you take any on as an advisor yourself?

Zanno: Yeah, so I've had many graduate students already in the past seven years—this fall I'll have five. One finishing a PhD, one's finishing their master's this summer, and I'm taking three new students starting in the fall. And then I've been really fortunate to work with post-docs, and that's been a real joy for me because these are individuals who—they are already scientists, and they're young scientists, and being able to give them a place to come and further develop their careers, and work with them, um, it's like having a really close colleague, but someone that you know you're also helping to achieve what they're after, and so that's been very special for me—is the ability to have post-docs here.

[00:50:00]

Brooks: And, I think you—I know we talked about when you were thinking about your advanced degrees—it didn't really faze you that there hadn't been any women in your program before. I'm always kind of interested in, um, people's takes in fields that are dominated—usually, typically—dominated by men. Um, how do you think that's affecting the future, in terms of—I'm thinking a lot about women in STEM and just these fields that typically are seen as masculine, um—how do you

think that's affecting our younger generations? And what—and what, if anything, should we do about it?

Zanno: How do I think the bias against—

Brooks: The bias, and I guess more so the fact that, um, it just seems to be a fact that men are better at science and math—men make up most scientists—that it just tends to be a more masculine career field, and that's what our young women see.

Zanno: Yeah, I—again—I don't know. I don't have the answers. I know that, um, that it's women in positions of power that are able to make a difference. And as much as the diversity has grown—and I think in my discipline when I go to our annual conference—I think now there are probably more women at the earliest stages than there are men entering the discipline—and yet still at this point in my life I'm still one of a handful of women dinosaur paleontologists who have a job in a museum—a major museum—or a major university around the country. So—but I have the ability to effect change, right, because I have the ability to create a more supportive environment for all students—not just women—women and men, and, you know, underrepresented groups in paleontology [laughs]. And we have a long, long, long way to go, you know, even outside of women. But I still, you know—we still are not getting there—to the upper levels—of increasing diversity at those levels—and that's really what it takes. Although I do find that a lot of the men who came up with me through grad school, at about my level, who are now in positions of power, are cognizant of these issues—they reach out to me and ask me, you know, for female contacts to include more and network more. And those are really, incredibly important because it's all of those opportunities outside of just doing your science that create a successful career path. Um, you know, it's being invited on editorial boards, or to direct a non-profit, or all of these, sort of, ancillary things that allow you to network and move forward in your career. And it's just such a challenge. I mean, I was the only woman in my program, and I remember people in my program, you know, networking by going to strip clubs at conferences. You know, I mean, I don't even know what to say about that. Like, I'm not gonna go, right? So then, then, there's a bunch of men in a room making, um, field plans and getting to know each other and offering each other opportunities and getting buddy-buddy, so they can collaborate, and you're just not there. Right? But, so, if there are women in those positions that can create, you know, the kinds of opportunities that include a diversity of people then I think that makes a difference. And so I'm just trying to move into more and more of those positions where I can help shape sort of a better environment.

Brooks: Do you—would—do you ever talk specifically to young women scientists, and have like, advice for them?

Zanno: Not anyone I haven't directly mentored. So, if I—I've had an unusual number of female grad students and post-docs in my program, and we certainly talk about

these issues all the time, and we run ideas off each other—you know, How do we react to this situation? You know, I might sometimes will be asked to give a—and it goes in the reverse, too—I think that's what's most interesting for me is I don't like to be invited to do things because I'm a women. And so that's not the solution. And what I feel like is—that in my discipline, what—what people—you know, people care and they're trying to make a difference, and they adopt this easy solution of, Oh, well, we'll bring these people on or invite them to do this because they're women. That's not what women want. We just want the same opportunities. We don't want to be singled out and given opportunities over other people because of our sex. That's just reverse sexism, right? That's not solving the problem. So, I know I've been asked to give a talk—you know, for example recently—asked to give a talk about some research that I was a part of, but I wasn't the lead researcher. And I said to this individual, "You know, you really should invite this person to present on this research because they're the first author, and I was just a contributor," and they said, "Oh, yeah, but the thing is we've been told we need to have women." And it was so insulting. [laughs] Like, I understand it was good intentioned, but to be told that you were being invited somewhere because you were a woman and not based on your research is also not the way we need to be handling these situations.

[00:55:28]

- Brooks: Um, so, let's talk more about dinosaurs. Recently, your team discovered a new dinosaur, is that correct?
- Zanno: Yeah, we do that fairly often.
- Brooks: You do that often, okay. So as a person who doesn't, you know—I don't really know much about dinosaurs besides the, probably, non-factual Jurassic Park stuff, um—how often are new dinosaurs discovered, typically?
- Zanno: Oh, my goodness, we are in this—just this explosion of dinosaur discoveries. Um, something like fifty to seventy new dinosaurs are named every year.
- Brooks: Wow.
- Zanno: Such that I can't really keep up anymore.
- Brooks: Is that just here in the US or across the—
- Zanno: All around the world.
- Brooks: Yeah.
- Zanno: Yeah.
- Brooks: Wow. And, what is that in terms of growth—like, do you know about how many in the past decades have been found per year?

Zanno: I don't really know those stats off the top of my head, but we're definitely naming more dinosaurs than we ever did. I mean, really started with the explosion out of China, around the turn of the millennium, when Chinese paleontology, really—they started making incredible discoveries over there, and it's a good—it's exploded, in terms of the number of new dinosaurs they're finding there. Um, but also just that the new generation of paleontologists—there just seems to be more capacity for it right now, which is a really wonderful thing.

Brooks: Can you talk at all about—I don't know if they have—there's a technical word for them—but essentially people who are amateur fossil hunters, people who find dinosaurs who aren't trained paleontologists?

Zanno: Yeah, I mean, there's a number of ways people contribute to paleontology. There's um, people who love to just hunt for fossils, and some people do that for their personal collections, um, some people do that as a commercial entity, to sell those fossils as a business, and some people do that by working with professional groups, volunteering on, say, museum or university expeditions to contribute to the science that's being done at those institutions. So there's kind of a variety of ways people, um, who love hunting for fossils will get involved in that.

Brooks: Does that ever come into conflict with what you and the professionals are trying to do?

Zanno: It can. I mean, it can come into conflict, um, particularly with commercial companies. And the way it can come into conflict is that some commercial dealers will go to private property and tell them not to work with scientists, um, and so they're—and then—that is not everyone—you know, I'm not painting this with a broad brush, but in some instances that does happen, and that does create a conflict, because, obviously, we don't have the—we're not selling the fossils—we don't have the funds to, you know, be paying an exorbitant amount of money for private fossil specimens, so we depend a lot on building good respectful relationships with landowners who are willing to donate those fossils to the institutions, so they can be in the public trust. They can be put on display for people to engage with, and they can be studied. Uh, so that we all benefit from that knowledge. And they there are other commercial collectors who work really well with professional paleontologists and contribute a lot to the discipline. So there's kind of a diversity of people involved.

[00:58:59]

Brooks: Mm-hm. How have things changed in terms of technology since you started?

Zanno: Um, technology has changed a lot the way we study fossils—not huge amount the way we find them. Although, thank God for Google Earth. I can't tell you [laughs] how it has changed my life in the field. Um, so, what—you know, we really haven't incorporated, um, things like remote sensing and other things that, say,

archaeology is using now to find lost cities and things. It doesn't really—we haven't found a good application for that with paleontology, but just being able to look at satellite images and figure out how to get where you wanna go, um, is completely different from just being on the ground and trying to figure out what's beyond the next hill when you can't see it. And so it's really allowed us to target our survey and prospecting work in a new way and make it much more efficient that we can, you know, map out a route to get where we need to go or see hidden basins that you can't see from the ground from the air. Um, so that's helped a lot. And then on the research side we're using all kinds of new imaging techniques, we're using, um, techniques from other disciplines that we've incorporated a lot—molecular techniques, um—to better understand the biology of these animals.

Brooks: Can you talk about the process that goes into naming a new dinosaur?

Zanno: Yeah, I mean, I can only talk about my process, 'cause it's kind of, I suppose, individual for everyone, and, um, I like short dinosaur names, I'll admit [laughs]. I like dinosaur names I can say [laughs]. I would always get frustrated when someone has this beautiful Latin name that, you know, translates to something incredible but is just so hard for people to pronounce—it was just kinda like, Oh. So I tend to look for names that I think evoke the story of this animal, why—you know, what it helps us understand more about ancient life. So for this new tyrannosaur that we named—you know, the story that comes from its discovery is really about the origin of tyrannosaurs in North America and the lineage leading to *T. rex*—and so I chose a name that, you know, reflected that this animal was the harbinger of doom, you know, of some fantastical embodiment of death and destruction that would be *T. rex*. Um, so I really enjoy the creative process of coming up with names.

Brooks: Who—how is it determined who gets to name the dinosaur?

Zanno: Uh, I mean the lead researcher gets, usually, to pick the name, unless someone has made an important—say, donated the fossil—and they want to recognize their contribution. Um, oftentimes you'll recognize that—honor that—by naming—maybe the species name after them—or recognize people who've contributed to the discipline by naming a dinosaur after them. Um, and sometimes you just pick a name because it's fun [both laugh].

Brooks: Do you know how many dinosaurs you've named personally?

Zanno: Actually chosen the name for? Um. Oh my goodness, that's a good question. Um.

Brooks: You can list them out loud if you want.

Zanno: So, I—so the first dinosaur I chose the name for was an animal called *Hagryphus*, um, which was an oviraptorosaur. And I named *Falcarius*. I chose that name. Um, we named *Siats*, which was a giant carcharodontosaur. We named *Moros*. Um, we named *Carnufex*, which is a North Carolina-native animal, that was actually an

ancient crocodile. Um, I'm probably forgetting some things. So I'd say at least five. Yeah.

Brooks: What's your favorite part of your job these days?

Zanno: My favorite part of my job these days is any day I get to spend actually looking at a fossil [laughs]. I, you know—so much of what I do now is administration and keeping everything running, um, that I often get very little time for science. And that's unfortunate because that's the one thing I'm so passionate about. You know, people talk to me about moving on in my career, beyond this, but there's really nowhere to go beyond this that doesn't involve more administrative work, and that's not really the direction I wanna go. Science is my first love and something that I don't ever wanna give up the time to do, and so, um, in many ways, science is now done, um, outside my work hours [laughs]. Sort of a full-time job just to keep everything running, and then, when—you know, on nights and weekends and other things—when I wanna do science, I try and shove it in there.

Brooks: Unwind with science.

Zanno: Yeah, unwind with science, yeah [both laugh].

Brooks: You had mentioned this before a little bit when we were talking about, I guess like, post-docs and essentially—when you get on faculty, and all—the expectations and the idea of, like, you have to kind of make money to make your job exist. Um, and I know that can be a really uncomfortable thing for a lot of people to accept and have to take into as part of their job. So, do you have any tips for fundraising and for things that you've found that work well for you in terms of, like, kind of being a salesperson for your work?

Zanno: Um. Boy, that's a good question. I mean, I sort of feel like the funding system in America is failing in a lot of ways, so I hate to provide people tips for succeeding in the system we have, as opposed to, you know, what I think would work better. And honestly, I think a lot of other countries—Canada's a good example—have a model where they invest in people. And you know, if you're a new researcher, and you have good ideas, and you're establishing a lab, you get a certain amount of money annually to do that, and then—you could—you have to continue to apply for this and prove that you're doing good work, but they're investing in you and your lab, which gives you some stability. And in the US, all the funding is project based. So, that means whoever's sitting at NSF and decides, This is NSF's next big initiative we're gonna throw money at, every lab around the country is trying to figure out how to shift their research to fit that and how to develop a project that will get that piece of funding. And so you're constantly just like—like a tennis ball—you're bouncing from project to project to project, trying to find something compelling to fit with whatever the funding is. And when you don't—because these days it's so extraordinarily competitive—I mean, paleontology does not even have its own funding source at NSF—we share it—

Brooks: What's NSF?

Zanno: The National Science Foundation, which is where most of our funding comes from. Most disciplines have a panel with a certain budget that's awarded to support that discipline. And, in paleontology, we share our budget with soft-rock geology, for example. So, um, there's just very, very, very little federal funding that goes to support this. And so it's so extremely competitive, you know. Less than ten percent of grants get approved. I've had grants that have gone in and come back with five "excellents" and not been funded because there wasn't funding. Um, so—I don't that [laughs]—I don't know that—that's not answer to the question you asked. But I do think it's worth, like, if the public's listening to this interview, I think it's worth them understanding the struggle scientists have to just run a lab. I mean, funding is inconsistent. Some years it goes through, some years it doesn't. There's not enough federal funding to do that, and your—you have to—when you get funding for something then you shift everything you've been working on for the past five years to this other thing. And it's a very poor way to advance the knowledge base in the US.

[01:06:58]

Brooks: That's frustrating. Um, what are you working on now?

Zanno: I'm working on a million things right now.

Brooks: Yeah!

Zanno: Yeah!

Brooks: [both speaking at once] That's what it sounds like, that's what I'm saying essentially—

Zanno: [both speaking at once] We've got a million projects—yeah, uh-huh. So I'm working on a project on medullary bone. I have an incredible post-doc and a colleague at NC State, Mary Schweitzer, and the three of us are working on, um, understanding—this is reproductive tissues in birds. So, uh, when birds are getting ready to lay eggs, they lay down calcium reserves inside their bones, and then they use those reserves to lay eggs. So, this has been a controversial topic in paleontology because some researchers have thought they've identified special tissue called medullary bone in dinosaurs, and if they do—if they do have it correct—then they've presented the first real evidence for a dinosaur being female. Which up until this point we've never had. And it's funny to think about, I mean if you think about living animals, so those sorts of fundamental questions about an animal you know, right? But with a dinosaur we don't even know if it's a male or a female—these very, very basic things sometimes are just lost to us. So, we've been studying that tissue in living birds and trying to understand how to identify it in fossils. So that's one of the big projects that we have right now.

Um, I have a big field project where we do, you know, a couple months of field work each year across the Southwestern US and Colorado and Utah and New Mexico looking for the remains of lost ecosystems that really haven't been well-discovered or described yet. And so we go out to these remote places, and we set up a camp, and we prospect; we find sites; we excavate those bones, and that's where most of our new dinosaur discoveries come from. And the point of that project is to connect what's happening with dinosaurs with climate change at the time because this is a really dynamic interval in Earth's history when global temperature was rising, sea level was rising, and the landscape was changing quite a bit, and we have dinosaurs sort of moving back and forth between North America and Asia, and it causes kind of a, uh, ecosystem collapse for North America. And then these new dinosaurs come in and become established, and they go on to be really successful. So it's this really wonderful transition window. And so we're trying to figure out what lived here and when because that's the data that we need to be able to figure out how that climate change impacted dinosaurs at that time.

Brooks: So those are two examples of the big things that you have going on. How do you—I mean, seriously, how do you, like, unwind? Do you turn your brain off from science ever?

Zanno: I do. I most certainly do. Um, I garden. That sounds so lame. I'm really passionate about plants. I love plants [whispering]. I think, if I hadn't been a paleontologist, I might have been a botanist. Um, and so I have my garden. And when I go out there, and I just am, you know, working in the garden, my brain is just completely focused on what I'm doing, and that is super important for my mental health. Yeah.

[01:10:10]

Brooks: And you said, when you were younger, art was really important to you, and I know you have artists in your family, so does art play a role in your life still?

Zanno: It doesn't anymore, and I'm really sad about that. And I've um—I've gotten to the point where now my kids are old enough—they're eight and fifteen—where they're kind of engaged on their own most of the time. And so, I am just working on building a little studio area in my home so I can get back to painting and drawing and sort of bringing back those aspects of my personality that just frankly had to go when it was all kids and all career. So kind of helpful that I can become more of the person that I used to be.

Brooks: Um, anything else career-wise that we should touch on? Accomplishments and things?

Zanno: I don't think so.

Brooks: You have a long—a very long—CV that you gave me with a lot of awards that you won and—do you have, like, a most memorable award?

Zanno: You know, I just received a really special award at NC State, for outstanding engagement—and honestly, I haven't received a lot of awards—um, and it was important to me because I've spent so much energy recently really invested in that. And so it was a really wonderful recognition of all the work. And it's certainly not just me, there's so many people on my lab who've invested in connecting with the public through this incredible building. And all of us together really, um—just all the work, incredible work they've been doing—that was a really special recognition of that, so that's nice.

Brooks: Mm-hm, that's great. Um, and do you—um, these are some of the kind of general reflection questions that I've been asking folks for the project. What's your definition of success and how has it changed over time?

Zanno: Um, I would have to start answering that question by saying that my definition of success changed the day my mother died. Um, because I watched her, as a woman, put her dreams on hold her entire life and sacrifice them for her children and then have that ripped out of her hand, you know, at the last minute. And what I learned on her deathbed was that every day is a gift, and, literally, [you] need to live day-by-day. And so, um, there are pros and cons to that. One of the cons is that I don't—I invest almost everything I have in almost every day of my life—I don't set too much stock by what's gonna come down the road later, kind of just live on the fly that way. Um, and so success for me is kind of just being happy with myself every day. That's a very simple concept for me. I don't have these enormous ambitions by which I would hold myself successful or a failure. I'm good to my kids and my husband, and I do my job the best I can every day, and I have fun, and I try and be as good as I can to people, and that's—to me—that's all success [laughs].

Brooks: Yeah. And what is a notable woman?

Zanno: A notable woman. Every single woman is a notable woman, my God.

Brooks: Um, and what haven't we talked about that you wanna talk about?

Zanno: I don't know [whispering]. I feel like I've talked a really long time.

Brooks: I don't think we've been going that long!

Zanno: Oh, okay.

Brooks: I have a couple questions that my nephew asked me to ask you. He's five, and he really likes dinosaurs. Um, and I feel like, it might be—it might be worthwhile to have it recorded. If not, people don't have to listen to it. Um, but he did wanna know what your favorite type of dinosaur is [both laugh].

Zanno: Okay, so my favorite dinosaur, um, my top three favorite dinosaurs are all alive.

Brooks: Oh?

Zanno: Number one favorite dinosaur is a bird called the secretary bird, and number two is a bower bird. I don't know if you know what a bower bird is, but they're these incredible birds that build these elaborate homes and then decorate them with, like, colored objects. And then my third favorite dinosaur is a shoebill, which is also a living bird. Now if I had to pick an extinct dinosaur, I'm gonna say it's therizinosaur, so you'll have to ask him if he knows who that is.

[01:14:48]

Brooks: I will. Yeah. So what is it about that question that—is it just that you get it all the time, and it's tedious?

Zanno: I think it's just that—my personality—I don't have favorites. Um, I try and just—I think I said this about people, is that—I try and just see what's beautiful about everything. So I feel like favorites is really limiting. I don't like to categorize myself or my interests or, you know, what I love or am passionate about into too many tiny boxes.

Brooks: That makes sense. Um, he wanted to know if you have ever found a small dinosaur?

Zanno: A small din—yeah, I've found small dinosaurs! [both laugh] Like, really small? Like, I've found dinosaurs that are maybe um, like, four feet long—that's pretty small for a dinosaur, right?

Brooks: And are most of the fossils that you find—can you age—can you tell how old they are about?

Zanno: You can tell how old they are if you cut them open—

Brooks: How old the dinosaur was? Not how—yeah—

Zanno: Right. How old the dinosaur was when it died? If you, if you—so dinosaurs grew like trees, um, so they leave rings inside their bones that correspond to annual growth cycles and rest cycles. And so if you cut into their limb bones, you can sort of count up those rings and get a sense of how old the dinosaur was when it died.

Brooks: Wow. And how—is that pretty common, like there's usually like a bone that's chosen to get cut open?

Zanno: Yeah, I mean usually we'll choose like the upper leg bone to look at.

Brooks: And so, have most of the dinosaurs that you've found or been a part of the discovery, have they been, like, various ages?

Zanno: Yeah, well, we don't always cut—we kind of have to have a reason to do it because it's consumptive. Once you do it, you know, you've taken a piece of the fossil that you can't get back. For example with this small tyrannosaur that we just named, we really needed to know it wasn't just a juvenile of a big animal. It was really key to the research that we document that it was a small bodied animal, so we did cut open a leg, and we were able to count the growth rings in there, I think there were six or seven different cycles. And then there are years that are erased. As the animal's growing the bone is growing. It's erasing the first few lines and making new lines, so it's always gonna be older than that age. So, it was at least seven when it died, for example.

Brooks: How old is that for a dinosaur?

Zanno: Um, that's—for a dinosaur that size it's about right—it's close to adult size. Something like, um, the small tyrannosaur *Moros* would have been—maybe it was nine or ten at an adult size, and then something—like tyrannosaurus we know reached adult size at about twenty years of age. Um, so for most meat-eating dinosaurs are gonna be anywhere from a couple years of age to adult size, up to a couple decades.

Brooks: So, and I—this question kind of goes along the lines of why is paleontology important but, I'll be more specific—what kind of like, everyday application do you think that you can use paleontology for, and I guess, I'm mostly wondering like, why should we care?

Zanno: Sure. I think that's a fair question for anything. That's maybe not asked often enough. And is always asked about paleontology, and I think it's because there's a passion in our culture for paleontology, and so it often feels more like an art than a science, um, or a cultural icon than scientific data. And the truth is that, you know, we're human beings living on a dynamic planet, and we have challenges. And that planet is alive, and it's changing, and we have questions about how to survive—what's the best approach; what's sustainability, what—you know, out of all the things we could do, to preserve our world and make it safe for us to live on, you know, what are the things that we should do? And you know, we can't protect every organism that's alive on this planet right now in the face of extinction, who should we protect? And we need all of this data to make informed questions, even about human health. You know, um, diseases evolve. We know that. We know—most people understand antibiotic resistance and how organisms are adapting and changing. Paleontology is the longest running natural experiment on Earth. It's over four billion years of life responding to global change. So it's our real data on—to be able to answer these questions of how evolution works, and how life has got to be the way it is, how life responds to climate changes, both slow changes and quick changes in the face of mass extinction. And if we can just discover this data, understand what it means, and use it in a predictive framework, then we've got real world data for the way things have been to help us understand

the way things are going to be, and how we can effect change that's positive for us.

Brooks: Alright. That's great. Do you have anything else that you wanna say?

Zanno: Nope!

Brooks: Okay. [Zanno laughs] I'm gonna turn these recorders off.

Zanno: Okay.

Brooks: Thank you.

Zanno: You're welcome.

[01:20:01]

[End Interview]